Full Counting Statistics of a Quantum Point Contact with Time-dependent Transparency \(^1\) JIN ZHANG, YURY SHERKUNOV, NICHOLAS D’AMBRUMENIL, BORIS MUZYKANTSII, Department of Physics, University of Warwick — Controlled injection of single electrons into a ballistic conductor is essential for “moving-electron-based” quantum computation. We consider an electron system in two 1D ballistic conductors separated by a tunneling barrier at zero temperature. We present numerical results for the full counting statistics (FCS) for the case when the barrier potential is modulated in the presence of a time-dependent bias voltage applied between the leads. The calculation is based on Abanov and Ivanov’s formula[1]. For the case of a periodic input with a large number of cycles, we perform the calculation in discretized energy space and obtain the characteristic function \(\chi(\lambda)\) as well as physical observables such as the current, noise and entanglement entropy directly. We show how to optimize the gate potential of a quantum point contact to generate a single electron excitation with minimal noise. [1]A.G. Abanov and D.A. Ivanov, Phys.Rev.Lett., 100, 086602

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